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Relationship between third-generation cephems and isolation rate of Methicillin-Resistant *Staphylococcus aureus*: a retrospective observational study

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Background: Our study examined the relationship between the antibiotic use control and methicillin-resistant *Staphylococcus aureus* (MRSA) incidence at Asahi General Hospital (AGH). The isolation rate for MRSA at AGH peaked at 53% in 2004, consistent with a country-wide MRSA prevalence of about 65% in 2003. Prevalence at AGH has since declined steadily to less than 33% in 2009, after the institution of antibiotic use control.

Methods: We examined retrospectively 2317 MRSA patients and antibacterials in the whole hospital from April 2003 to September 2010 during three-month intervals. Univariate and multivariate analysis was performed to compare MRSA frequencies with consumption of multiple classes of antibacterials.

Results: Univariate analysis revealed that the appearance of MRSA patients positively correlated with the use of third-generation cephems at a correlation coefficient (R) of 0.737 ($p < 0.01$), and negatively correlated with the use of second-generation cephems ($R = -0.492$, $p < 0.01$) and penicillin ($R = -0.610$, $p < 0.01$). Multivariate analysis showed a correlation only with the use of third-generation cephems ($R = 0.81$, $p < 0.01$). Further, univariate and multivariate analysis revealed that the detection of MRSA positively correlated with only the use of cefotaxime at an R value of 0.741 ($p < 0.01$), and 0.79($P < 0.01$).

Conclusion: Decreased use of the third-generation cephems, especially cefotaxime, was associated with the reduced frequency of MRSA in patients at our hospital. Continuing decreases in the use of these drugs is expected to reduce the rate of isolation of MRSA in Japan.

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Surveillance of healthcare-associated infection at Angkor Hospital for Children, Siem Reap, Cambodia

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Background: Healthcare-associated infections (HAI) are a significant global threat. Surveillance data relating to HAI in the lance of HAI in a regional paediatric hospital in northwestern Cambodia.

Methods: Standardised monthly cross-sectional HAI point prevalence surveys (PPS) were conducted at the Angkor Hospital for Children (AHC), Siem Reap. AHC is a 50-bedded hospital, with critical care, surgical and medical inpatients <16 years of age. Every child in the hospital was reviewed on a single day each month for evidence of an HAI. Patients at risk were those whose infection developed after 48 hours in hospital. In December 2011 we also screened for *Staphylococcus aureus* and multi-drug resistant Enterobacteriaceae carriage.

Results: Between January and December 2011 622 patients were surveyed. The median age was 2.7 years (range 0-16 years, IQR 0.5-9); ICU/ER patients were significantly younger in age ($p<0.0001$). The number of patients at risk of HAI was greater in the intensive care (ICU), surgical (SU) and step-down care (LAU) settings ($p<0.001$). The overall prevalence of HAI was 13.2/100 patients at risk (3.1 on the SU to 45.1 in the ICU/Emergency room (ER)). The relative risk of having an HAI in ICU/ER was 5.9. The mean HAI prevalence declined from 14.9/100 in the first six months to 11.5/100 in the second, although this was not significant ($p = 0.32$). The commonest HAI was of respiratory origin (37/64; 58%). 79% of patients were receiving an antimicrobial including ceftriaxone (21.4%), ampicillin (5%), gentamicin (5.1%), cloxacillin (4.6%) and imipenem (3.8%). Five patients were found to be carrying *S. aureus* (9.8%), one methicillin-resistant (1.9% overall carriage prevalence). 83% of patients had faecal carriage of ESBL-producing Enterobacteriaceae.

Conclusion: This is the first HAI surveillance data from Cambodia and confirms HAI as a major problem with respiratory HAIs most common. Rates of ESBL-carriage are alarming, possibly driven by high ceftriaxone usage. Current interventions include a hand hygiene programme, a VAP-prevention care bundle and the implementation of an antimicrobial guideline. This simple method of surveillance can be used to monitor future HAI trends in response to interventions.

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Wound infection and skin consistency in aged patient with gastrectomy

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Background: Surgical site infection is one of the most important postoperative complications in aged patients with gastrointestinal surgery. Many pre and post operative conditions were listed of significant risk factors. The preoperative condition of the surgical site skin was not noticed as the risk factor of infection. In current report, we measured the skin consistency during the operation and evaluate the relationship between the consistency and wound infection in patients with gastrectomy.

Methods: A material has its own resonance frequency. If material touches an oscillated object, a shift of the resonance frequency

will be observed. The difference between the frequencies under pre and post oscillate conditions depends on the stiffness of the object (Young's ratio). So, the consistency of material can be measured by monitoring the shift in the frequency. Using the tactile sensor system, the measurements were made. We measured skin consistency during surgery in aged (65+) patients with gastrectomy. The primary disease, procedures, operative time, antibiotics, ASA classification, preoperative skin treatment, comorbidity, smoking history, BMI, wound contamination, post operative hyperglycemia, postoperative albumin, postoperative delirium and length of hospital stay were recorded. In case with infection, type of wound infection and the day of diagnosis as infection were also recorded.

Results: 39 patients had gastrectomy for gastric cancer and 7 patients suffered from wound infection. Age (75.6 with infection versus 73.7 without infection) and BMI (23.4 vs 21.7) indicated no statistical difference between with and without wound infection, as well as, skin consistency (503.8 vs 480.1). The operative time more than 180 minutes and NNIS risk index were only risk factors for infection. In patient with SSI, the length of hospital stay was longer than the patients without wound infection.

Conclusion: The skin consistency did not associate with the wound infection. Long time procedure and higher risk index were only risk factors for wound infection in mature patients with gastrectomy.

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Vancomycin-resistant *Enterococcus faecium* prevalent in Russian neonatal intensive care units

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Background: Outbreaks of vancomycin-resistant Enterococcus faecium (VRE) strains is an emerging problem worldwide. The important risk group for VRE infection and colonization are neonatal intensive care units (NICU) patients

The aim of study was to estimate a point prevalence of VRE in neonatal ICUs and to study clonal characteristics of isolated VRE.

Methods: A cross-sectional microbiological study of the neonates and environment repeated after a two months interval in NICU of two pediatric hospitals has been conducted. Resistance to vancomycin was defined by PCR detection of vanA cassette. 7 of isolated vancomicin-resistant Enterococcus faecium strains were characterized with respect to clonal relationships by using VNTR typing (MLVA) according to published recently protocol presented by Top J. et al., (2008).

Results: During the first cross-sectional study, VRE were isolated from 7 neonates with prevalence rates of infection 13.6 (95% CI = 3.6 - 32.8) in one unit and 16.7 (95% CI = 5.5 - 35.5) in another. After the first examination strict contact isolation precautions were recommended for patients infected with VRE. These recommendations were introduced in one of the units only. The second crosssectional study was conducted in 2 months after the first one. In the unit where the strict contact isolation was implemented, there were no new cases of colonization of the neonates with VRE. In the unit where the isolation precautions were not implemented, two new cases of colonization of the neonates with VRE were detected (with the prevalence rate of 8.3 per 100 patients).

Based on VNTR-typing the circulation of the three clonal lines of the vancomicin-resistant Enterococcus faecium has been demonstrated, one of which was common to the both hospitals.

Conclusion: Effective control of VRE requires microbiological monitoring of VRE in the high risk facilities, such as intensive care units. Detection of circulating VRE is possible with periodic cross-sectional studies. Strict contact precautions should be applied to the patients colonized with VRE.

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Changing etiology and risk factors of nosocomial bacterial meningitis: a nationwide multicenter study 1993-2010 in Slovakia

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Background: Nosocomial meningitis is still associated with unrespectable high mortality and sequelae. The aim of this study was to assess if differences in etiology, risk factors and outcome of bacterial nosocomial meningitis (NM) between tree periods of survey (1993 - 1998, 1999 – 2006 and 2007 - 2010) in Slovakia.

Methods: We performed multicentric observational study of nosocomial meningitis appearing in clinically hospital stay patients in 10 major hospitals (Bratislava, Trnava, Kosice, Ruzomberok, Nitra, Banska Bystrica, Nove Zamky, Presov, Zilina, Lucenec) in Slovakia. Two hundredand sixty-one patients diagnosed with NM, according to the criteria of the Centers for Disease Control and Prevention between 1993 and 2010 were evaluated retrospectively. Trends in risk factors and etiology of NM appearing 1993 – 1998, 1999- 2006 and 2007 – 2010 were compared. Differences between periods were assessed by univariate analysis. Chi-square test and Fisher's exact test computerized with the open source statistical package "R" were used and P < 0, 05 was considered statistical significant.

Results: During 17 years, we have detected 261 cases with attributable mortality of 12,1% and sequellae in 19%. Comparing the three periods in our study of nosocomial meningitis in etiology staphylococci was decreasing (18,2% vs. 3,4%; $P = 0{,}023$) and gram-negative etiology was stable during all study period (52,7% vs. 41,6% vs. 55,9%; $P = 0{,}876$). Perinatal pathology or CNS abnormality, hydrocephalus as a complications and very low birth weight neonates significant decreasing between first and last period of study. Concerning risk factors craniocerebral trauma (7, 1% vs. 20%, P < 0,01) were more significant prevalent in late study period in comparison to the first study period. No significant change in mor-